

## PD Dr. Ulrich Schwarz



03/03/1966, Stuttgart

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Group leader

## SCIENTIFIC VITA

1987 - 1990 Physics student, Freiburg University  
1990 - 1991 Fulbright scholar, Johns Hopkins University, Baltimore, MD, USA  
1991 - 1994 Physics student, Munich University  
1994 - 1998 PhD, Max Planck Institute of Colloids and Interfaces, Potsdam  
1998 - 2000 Postdoc, Minerva fellow, Weizmann Institute, Rehovot, Israel  
2000 - 2005 Group leader, Max Planck Institute of Colloids and Interfaces, Potsdam  
2001 - now Emmy Noether junior research group leader  
2003 Visiting professor, Leipzig University  
2004 Habilitation, Potsdam University  
2005 - now Group leader, Center for Modelling and Simulation in the Biosciences (BIOMS)  
2005 - now Member, Interdisciplinary Center for Scientific Computing (IWR), Heidelberg  
2006 - now Privatdozent, Department of Physics and Astronomy, Heidelberg University

## COORDINATING FUNCTIONS

2003 Organizer Second MPI-UPenn Symposium on Soft Matters, Potsdam  
2004 Organizer Max Planck Symposium on Systems Biology, Potsdam  
2005 Organizer WEH-seminar "Dynamics of cell and tissue structure", Bad Honnef  
2005 - now Member programme committee "Engineering stem cell microenvironments"  
2005 - now Member Rektoratskommission "BIOQUANT"

reviewer for 15+ journals, including "Physical Review Letters" and "Biophysical Journal"  
15 invited conference talks since 2000, including "IoP2005: Physics, a century after Einstein" and "World Congress of Biomechanics 2006"

## FIELDS OF INTEREST

Theoretical physics, statistical mechanics, physics of soft condensed matter, biological physics, computational cell biology, quantitative and systems biology, cell mechanics and adhesion

## CURRENTLY FUNDED PROJECTS

Emmy Noether junior research group; BIOMS junior research group (Klaus Tschira Foundation, Landesstiftung Baden-Württemberg, Heidelberg University); VW Foundation

Currently supervision of 4 interns, 3 doctoral theses, 2 postdocs

## PUBLICATIONS (10 selected publications since 2000):

Bischofs, I. B. and **U. S. Schwarz**. 2005. Effect of Poisson ratio on cellular structure formation. *Phys. Rev. Lett.* **95**: 068102.

**Schwarz, U. S.** and I. B. Bischofs. 2005. Physical determinants of cell organization in soft media. *Med. Eng. Phys.* **27**: 763-72.

Erdmann, T and **U. S. Schwarz**. 2004. Stability of adhesion clusters under constant force. *Phys. Rev. Lett.* **92**: 108102.

**Schwarz, U. S.** and R. Alon. 2004. L-selectin mediated leukocyte tethering in shear flow is controlled by multiple contacts and cytoskeletal anchorage facilitating fast rebinding events. *Proc. Natl. Acad. Sci. USA* **101**: 6940-6945.

Dwir, O., A. Solomon, S. Mangan, G. S. Kansas, **U. S. Schwarz**, and R. Alon. 2003. Avidity enhancement of L-selectin bonds by flow: shear-promoted rotation of leukocytes turn labile bonds into functional tethers. *J. Cell Biol.* **163**: 649-659.

Bischofs, I. B. and **U. S. Schwarz**. 2003. Cell organization in soft media due to active mechanosensing. *Proc. Natl. Acad. Sci. USA* **100**: 9274-79.

**Schwarz, U. S.**, N. Q. Balaban, D. Riveline, A. Bershadsky, B. Geiger, and S. A. Safran. 2002. Calculation of forces at focal adhesions from elastic substrate data: the effect of localized force and the need for regularization. *Biophys. J.* **83**: 1380-1394.

Balaban, N. Q., **U. S. Schwarz**, D. Riveline, P. Goichberg, G. Tzur, I. Sabanay, D. Mahalu, S. Safran, A. Bershadsky, L. Addadi, and B. Geiger. 2001. Force and focal adhesion assembly: a close relationship studied using elastic micro-patterned substrates. *Nat. Cell Biol.* **3**: 466-72.

Riveline, D., E. Zamir, N. Q. Balaban, **U. S. Schwarz**, B. Geiger, Z. Kam, and A. D. Bershadsky. 2001. Focal contact as a mechanosensor: externally applied local mechanical force induces growth of focal contacts by a mDia1-dependent and ROCK-independent mechanism. *J. Cell Biol.* **153**: 1175-1185.

**Schwarz, U.S.** and G. Gompper. 2000. Stability of inverse bicontinuous cubic phases in lipid-water mixtures. *Phys. Rev. Lett.* **85**: 1472-1475.